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=> set plurals on perm
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=> s (non(1w)oxidative? or nonoxidative? or no oxidati? or without oxidati?)(2a)(dehydrogenat?)
L1 2135 (NON(1W) OXIDATIVE? OR NONOXIDATIVE? OR NO OXIDATI? OR WITHOUT OXIDATI?)(2A)(DEHYDROGENAT?)

=> s (n-butane# or butane#)(2a)dehydrogenat?
L2 1810 (N-BUTANE# OR BUTANE#)(2A) DEHYDROGENAT?

=> s l1 and l2
L3 162 L1 AND L2

=> s butadiene(1a)(prepar? or synthesiz? or synthesis? or produc?)
L4 15604 BUTADIENE(1A)(PREPAR? OR SYNTHESIZ? OR SYNTHESIS? OR PRODUC?)

=> s l3 and l4
L5 68 L3 AND L4

=> s l5 and oxidativ?(1a)dehydrogenat?
L6 68 L5 AND OXIDATIV?(1A) DEHYDROGENAT?

=> d l6 1-34 ibib abs

L6 ANSWER 1 OF 68 USPATFULL on STN
ACCESSION NUMBER: 2004:328307 USPATFULL
TITLE: Method for producing 4-vinylcyclohexene, ethyl benzole and styrene
INVENTOR(S): Walsdorff, Christian, Ludwigshafen, GERMANY, FEDERAL REPUBLIC OF
Schindler, Gotz-Peter, Mannheim, GERMANY, FEDERAL REPUBLIC OF
Harth, Klaus, Altleiningen, GERMANY, FEDERAL REPUBLIC OF

Hibst, Hartmut, Schriesheim, GERMANY, FEDERAL REPUBLIC OF

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004260132	A1	20041223
APPLICATION INFO.:	US 2004-501876	A1	20040720 (10)
	WO 2003-EP1577		20030217

	NUMBER	DATE
PRIORITY INFORMATION:	DE 2002-10206954	20020219
	DE 2002-10231633	20020712

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: KEIL & WEINKAUF, 1350 CONNECTICUT AVENUE, N.W., WASHINGTON, DC, 20036
NUMBER OF CLAIMS: 9
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 4 Drawing Page(s)
LINE COUNT: 971
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention relates to a process for preparing 4-vinylcyclohexene, which comprises the steps

(A) providing an n-butane-containing feed gas stream,

(B) feeding the n-butane-containing feed gas stream into at least one dehydrogenation zone and **dehydrogenating n-butane** to butadiene to give a product stream comprising butadiene, n-butane, possibly 1-butene and 2-butene and possibly water vapor and other secondary constituents,

(C) feeding the product stream from dehydrogenation, if appropriate after separating off water vapor and secondary constituents, into a dimerization zone and catalytically dimerizing butadiene to give a product stream comprising 4-vinylcyclohexene, n-butane and possibly 1-butene, 2-butene and unreacted butadiene, and

(D) separating off 4-vinylcyclohexene from the product stream from the dimerization and recirculating n-butane and possibly 1-butene, 2-butene and unreacted butadiene to the dehydrogenation zone.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 2 OF 68 USPATFULL on STN
ACCESSION NUMBER: 2001:142510 USPATFULL
TITLE: Vanadium-containing catalysts, process for manufacturing and use of the same
INVENTOR(S): Kishimoto, Nobuji, Himeji, Japan
Matsunami, Etsushige, Himeji, Japan
PATENT ASSIGNEE(S): Nippon Shokubai Co., Ltd., Osaka, Japan (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6281378	B1	20010828
APPLICATION INFO.:	US 2000-586777		20000605 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1998-109147, filed on 12 Nov 1998, now abandoned Division of Ser. No. US 776543, now patented, Pat. No. US 5877330, issued on 2 Mar 1999		

	NUMBER	DATE

PRIORITY INFORMATION: JP 1995-142266 19950608
DOCUMENT TYPE: Utility
FILE SEGMENT: GRANTED
PRIMARY EXAMINER: Lambkin, Deborah C.
LEGAL REPRESENTATIVE: Kubovcik & Kubovcik
NUMBER OF CLAIMS: 19
EXEMPLARY CLAIM: 1
LINE COUNT: 1515
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Vanadium-containing catalysts are obtained by using polyvanadic acid as a source of vanadium. Vanadium-containing catalysts are obtained by mixing catalyst components other than vanadium, or their precursors, with a polyvanadic acid sol which is formed by ion-exchanging a metavanadic acid aqueous solution with a proton-type cation-exchange resin and performing polycondensation, and by drying and/or calcining the mixture. Such vanadium-containing catalysts can fully exhibit their catalytic activity under mild reaction conditions, and can be suitably used for various reactions, such as synthesis of phthalic anhydride by the partial oxidation of o-xylene, synthesis of benzaldehyde by the partial oxidation of toluene, synthesis of benzoic acid by the partial oxidation of toluene, synthesis of anisaldehyde by the partial oxidation of p-methoxy toluene, synthesis of propylene by the **oxidative dehydrogenation** of propane, synthesis of isobutene by the **oxidative dehydrogenation** of isobutane, synthesis of methyl formate by the **oxidative dehydrogenation** of methanol, and synthesis of acrylonitrile by the ammoxidation of propane.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 3 OF 68 USPATFULL on STN
ACCESSION NUMBER: 1999:27783 USPATFULL
TITLE: Vanadium-containing catalysts, process for manufacturing and use of the same
INVENTOR(S): Kishimoto, Nobuji, Himeji, Japan
Matsunami, Etsushige, Himeji, Japan
PATENT ASSIGNEE(S): Nippon Shokubai Co., Ltd., Osaka, Japan (non-U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 5877330		19990302	
	WO 9641678		19961227	
APPLICATION INFO.:	US 1997-776543		19970129	(8)
	WO 1996-JP1547		19960607	
			19970129	PCT 371 date
			19970129	PCT 102(e) date

	NUMBER	DATE
PRIORITY INFORMATION:	JP 1995-142266	19950608

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Owens, Amelia
LEGAL REPRESENTATIVE: Kubovcik & Kubovcik
NUMBER OF CLAIMS: 43
EXEMPLARY CLAIM: 1
LINE COUNT: 1614
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Vanadium-containing catalysts are obtained by using polyvanadic acid as a source of vanadium. Vanadium-containing catalysts are obtained by mixing catalyst components other than vanadium, or their precursors, with a polyvanadic acid sol which is formed by ion-exchanging a metavanadic acid aqueous solution with a proton-type cation-exchange resin and performing polycondensation, and by drying and/or calcining

the mixture. Such vanadium-containing catalysts can fully exhibit their catalytic activity under mild reaction conditions, and can be suitably used for various reactions, such as synthesis of phthalic anhydride by the partial oxidation of o-xylene, synthesis of benzaldehyde by the partial oxidation of toluene, synthesis of benzoic acid by the partial oxidation of toluene, synthesis of anisaldehyde by the partial oxidation of p-methoxy toluene, synthesis of propylene by the **oxidative dehydrogenation** of propane, synthesis of isobutene by the **oxidative dehydrogenation** of isobutane, synthesis of methyl formate by the **oxidative dehydrogenation** of methanol, and synthesis of acrylonitrile by the ammoxidation of propane.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 4 OF 68 USPATFULL on STN
ACCESSION NUMBER: 94:31225 USPATFULL
TITLE: Process of oxidizing aliphatic hydrocarbons employing a molybdate catalyst encapsulated in a hard, glassy silica matrix
INVENTOR(S): Vrieland, G. Edwin, Midland, MI, United States
Doktycz, Stephen J., Midland, MI, United States
Khazai, Bijan, Midland, MI, United States
PATENT ASSIGNEE(S): The Dow Chemical Company, Midland, MI, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5302773		19940412
APPLICATION INFO.:	US 1991-797882		19911126 (7)

RELATED APPLN. INFO.: Continuation-in-part of Ser. No. US 1990-505751, filed on 6 Apr 1990, now patented, Pat. No. US 5146031 which is a continuation-in-part of Ser. No. US 1989-383107, filed on 20 Jul 1989, now patented, Pat. No. US 4973791, issued on 27 Nov 1990
DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Garvin, Patrick P.
ASSISTANT EXAMINER: Irzinski, E. D.
LEGAL REPRESENTATIVE: Zuckerman, Marie F.
NUMBER OF CLAIMS: 38
EXEMPLARY CLAIM: 1
LINE COUNT: 1392
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A process for preparing olefins and diolefins in high productivity which involves contacting an aliphatic hydrocarbon, such as butane, with a heterogeneous catalyst composition containing reactive oxygen under reaction conditions sufficient to produce a more highly unsaturated aliphatic hydrocarbon, such as 1,3-butadiene. The catalyst composition contains a glassy silica matrix of specified surface area and macro-porosity into which are encapsulated domains of a catalyst component containing oxides of magnesium and molybdenum. The catalyst has high crush strength and is useful in transport reactors.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 5 OF 68 USPATFULL on STN
ACCESSION NUMBER: 93:91601 USPATFULL
TITLE: Process of oxidizing aliphatic hydrocarbons employing a molybdate catalyst composition
INVENTOR(S): Khazai, Bijan, Midland, MI, United States
Murchison, Craig B., Midland, MI, United States
Vrieland, G. Edwin, Midland, MI, United States
PATENT ASSIGNEE(S): The Dow Chemical Company, Midland, MI, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5258347		19931102
APPLICATION INFO.:	US 1992-890972		19920529 (7)

DISCLAIMER DATE: 20071127
RELATED APPLN. INFO.: Division of Ser. No. US 1990-505751, filed on 6 Apr 1990, now patented, Pat. No. US 5146031 which is a continuation-in-part of Ser. No. US 1989-383107, filed on 20 Jul 1989, now patented, Pat. No. US 4973791
DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Garvin, Patrick P.
ASSISTANT EXAMINER: Irzinski, E. D.
LEGAL REPRESENTATIVE: Zuckerman, Marie F.
NUMBER OF CLAIMS: 21
EXEMPLARY CLAIM: 1
LINE COUNT: 1278
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process for the production of olefins and diolefins, such as 1,3-butadiene, comprising contacting an aliphatic hydrocarbon, such as butane, with a heterogeneous catalyst composition containing reactive oxygen under reaction conditions such that a more highly unsaturated aliphatic hydrocarbon is selectively formed in a high productivity. The catalyst is a composition comprising (a) a support component of magnesia and alumina and/or magnesium aluminate spinel, and (b) a catalyst component of magnesia, an oxide of molybdenum, a Group IA metal oxide promoter, and optionally vanadium oxide. Catalysts of high surface area and high attrition resistance are claimed.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 6 OF 68 USPATFULL on STN
ACCESSION NUMBER: 92:74795 USPATFULL
TITLE: Process of oxidizing aliphatic hydrocarbons employing a molybdate catalyst composition
INVENTOR(S): Khazai, Bijan, Midland, MI, United States
Vrieland, G. Edwin, Midland, MI, United States
Murchison, Craig B., Midland, MI, United States
Dixit, Ravi S., Midland, MI, United States
Weihl, Edwin D., Coleman, MI, United States
PATENT ASSIGNEE(S): The Dow Chemical Company, Midland, MI, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5146031		19920908
APPLICATION INFO.:	US 1990-505751		19900406 (7)

RELATED APPLN. INFO.: Continuation-in-part of Ser. No. US 1989-383107, filed on 20 Jul 1989, now patented, Pat. No. US 4973791
DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Pal, Asok
ASSISTANT EXAMINER: Irzinski, E. D.
LEGAL REPRESENTATIVE: Zuckerman, Marie F.
NUMBER OF CLAIMS: 33
EXEMPLARY CLAIM: 1
LINE COUNT: 1323
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process for the production of olefins and diolefins, such as 1,3-butadiene, comprising contacting an aliphatic hydrocarbon, such as butane, with a heterogeneous catalyst composition containing reactive oxygen under reaction conditions such that a more highly unsaturated aliphatic hydrocarbon is selectively formed in a high productivity. The

catalyst is a composition comprising (a) a support component of magnesia and alumina and/or magnesium aluminate spinel, and (b) a catalyst component of magnesia, an oxide of molybdenum, a Group IA metal oxide promoter, and optionally vanadium oxide. Catalysts of high surface area and high attrition resistance are claimed.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 7 OF 68 USPATFULL on STN
ACCESSION NUMBER: 90:91305 USPATFULL
TITLE: **Oxidative dehydrogenation** of amylenes
INVENTOR(S): McFarland, Cecil G., Houston, TX, United States
PATENT ASSIGNEE(S): Texas Petrochemicals Corporation, Houston, TX, United States (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 4973793		19901127	
APPLICATION INFO.:	US 1989-363591		19890608	(7)

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Sneed, H. M. S.
ASSISTANT EXAMINER: Saba, James
LEGAL REPRESENTATIVE: Johnson, Kenneth H.
NUMBER OF CLAIMS: 21
EXEMPLARY CLAIM: 1
LINE COUNT: 753
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB Cofeeding butylenes with amylenes in a catalytic **oxidative dehydrogenation** reaction substantially improves the conversion of the amylenes. The approved amylene conversion is obtained by the **oxidative dehydrogenation** of mixtures of amylenes and from 10 to 95 mole % butylenes.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 8 OF 68 USPATFULL on STN
ACCESSION NUMBER: 88:40795 USPATFULL
TITLE: Chemical conversion process
INVENTOR(S): Coughenour, Glenn E., Bryn Mawr, PA, United States
Jubin, Jr., John C., Wallingford, PA, United States
PATENT ASSIGNEE(S): Atlantic Richfield Company, Los Angeles, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 4754095		19880628	
APPLICATION INFO.:	US 1984-601141		19840416	(6)

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Dixon, Jr., William R.
ASSISTANT EXAMINER: Hunter, Jr., James M.
LEGAL REPRESENTATIVE: Larson, Craig E.
NUMBER OF CLAIMS: 10
EXEMPLARY CLAIM: 1
LINE COUNT: 738
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A method is disclosed in which a first gas is contacted with a solid at an elevated reaction temperature to produce a gaseous product, the solid being deactivated during said contact and further, being exothermically reactivated by a second gas, the improvement which comprises providing the solids in at least three reactor zones and sequantically operating each reactor according to the cycle: reaction/reactant preheat/solids

reativation. Preferaly the reactors are operated concurrently such that, at any time, at least one reactor is producing product and at least one reactor is preheating reactant to reaction temperature.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 9 OF 68 USPATFULL on STN
ACCESSION NUMBER: 88:40794 USPATFULL
TITLE: Fixed bed reactor system
INVENTOR(S): Jubin, Jr., John C., Wallingford, PA, United States
PATENT ASSIGNEE(S): Atlantic Richfield Company, Los Angeles, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 4754094		19880628	
APPLICATION INFO.:	US 1984-601143		19840416	(6)

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Dixon, Jr., William R.
ASSISTANT EXAMINER: Hunter, Jr., James M.
LEGAL REPRESENTATIVE: Larson, Craig E.
NUMBER OF CLAIMS: 10
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 6 Drawing Figure(s); 6 Drawing Page(s)
LINE COUNT: 960
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A method is disclosed in which a first gas is contacted with a solid at an elevated reaction temperature to produce a gaseous product, the solid being deactivated during said contact and exothermically reactivated by a second gas and again contacted with the first gas, the improvement includes the steps of:

(a) providing a quantity of the solids in relatively equal amounts to at least these fixed bed reactors;

(b) sequentially operating each fixed bed reactor according to the cycle comprising: (1) preheating introducing the first gas into a first end of the reactor and withdrawing gaseous product from a second end of the reactor; (2) preheating the first gas to reaction temperature by introducing the first gas into the fixed bed of solids at a plurality of points along the length of the reactor and withdrawing the preheated gas from the second end of the reactor; and (3) reactivating the deactivated solids by introducing the second gas into the fixed bed of solids at a plurality of points along the length of the reactor and withdrawing second gas effluent from the first end of the reactor; and

(c) concurrently operating the reactors such that, at any given time, the first gas is being preheated to reaction temperature in at least one reactor, and the preheated first gas is being converted into second gas in at least one second reactor.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 10 OF 68 USPATFULL on STN
ACCESSION NUMBER: 88:37516 USPATFULL
TITLE: Fixed bed reactor system
INVENTOR(S): Jubin, Jr., John C., Wallingford, PA, United States
PATENT ASSIGNEE(S): Atlantic Richfield Company, Los Angeles, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4751055		19880614

APPLICATION INFO.: US 1985-799066 19851118 (6)
RELATED APPLN. INFO.: Division of Ser. No. US 1984-601143, filed on 16 Apr 1984
DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Schor, Kenneth M.
ASSISTANT EXAMINER: Cody, Lori Ann
LEGAL REPRESENTATIVE: Larson, Craig E.
NUMBER OF CLAIMS: 2
EXEMPLARY CLAIM: 2
NUMBER OF DRAWINGS: 6 Drawing Figure(s); 6 Drawing Page(s)
LINE COUNT: 910
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB An apparatus is disclosed in which a first gas is contacted with a solid at an elevated reaction temperature to produce a gaseous product, the solid being deactivated during said contact and exothermically reactivated by a second gas and again contacted with the first gas, the improvement includes the steps of:

(a) providing a quantity of the solids in relatively equal amounts to at least these fixed bed reactors;

(b) sequentially operating each fixed bed reactor according to the cycle comprising: (1) preheating introducing the first gas into a first end of the reactor and withdrawing gaseous product from a second end of the reactor; (2) preheating the first gas to reaction temperature by introducing the first gas into the fixed bed of solids at a plurality of points along the length of the reactor and withdrawing the preheated gas from the second end of the reactor; and (3) reactivating the deactivated solids by introducing the second gas into the fixed bed of solids at a plurality of points along the length of the reactor and withdrawing second gas effluent from the first end of the reactor; and

(c) concurrently operating the reactors such that, at any given time, the first gas is being preheated to reaction temperature in at least one reactor, and the preheated first gas is being converted into second gas in at least one second reactor.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 11 OF 68 USPATFULL on STN
ACCESSION NUMBER: 86:76771 USPATFULL
TITLE: **Oxidative-dehydrogenation** process
INVENTOR(S): Robinson, Paul R., Diamond Bar, CA, United States
Moorehead, Eric L., Diamond Bar, CA, United States
PATENT ASSIGNEE(S): Union Oil Company of California, Los Angeles, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4599477		19860708
APPLICATION INFO.:	US 1985-793494		19851030 (6)

RELATED APPLN. INFO.: Continuation of Ser. No. US 1985-749557, filed on 27 Jun 1985, now abandoned which is a division of Ser. No. US 1984-667000, filed on 31 Oct 1984 which is a continuation-in-part of Ser. No. US 1984-646291, filed on 29 Aug 1984 Ser. No. Ser. No. US 1984-595333, filed on 30 Mar 1984 Ser. No. Ser. No. US 1984-592422, filed on 21 Mar 1984, now patented, Pat. No. US 4555584 Ser. No. Ser. No. US 1983-492226, filed on 6 May 1983 Ser. No. Ser. No. US 1983-492163, filed on 6 May 1983 And Ser. No. US 1983-461942, filed on 28 Jan 1983, now patented, Pat. No. US 4481363 which is a division of Ser. No. US 1981-289806, filed on 3 Aug 1981, now

patented, Pat. No. US 4388221 , said Ser. No. 646291 which is a continuation-in-part of Ser. No. 461942 which is a division of Ser. No. 289806 , said Ser. No. 595333 which is a division of Ser. No. US 1981-335531, filed on 29 Dec 1981, now patented, Pat. No. US 4455388 which is a continuation-in-part of Ser. No. US 1981-328446, filed on 7 Dec 1981, now patented, Pat. No. US 4454245 , said Ser. No. 592422 which is a division of Ser. No. 328446 , said Ser. No. 492226 And Ser. No. 492163 , each which is a continuation-in-part of Ser. No. US 1981-275370, filed on 19 Jun 1981, now abandoned

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Davis, Curtis R.
LEGAL REPRESENTATIVE: Sandford, Dean, Wirzbicki, Gregory F., Franks, Robert A.
NUMBER OF CLAIMS: 9
EXEMPLARY CLAIM: 1
LINE COUNT: 887
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB **Oxidative dehydrogenation** catalysts suitable for converting C.sub.4 to C.sub.8 mono-olefins to conjugated dienes comprise vanadium, phosphorus, and alkali metal components, and preferably also a tin component, in combination with a microporous crystalline silica or a crystalline zeolite having a silica-to-alumina ratio of at least 6.0. In one embodiment, the catalyst has a surface area between 30 M.sup.2 /g to 450 M.sup.2 /g and the vanadium has an average valence in the range of from 3.50 to 4.95.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 12 OF 68 USPATFULL on STN
ACCESSION NUMBER: 86:5154 USPATFULL
TITLE: Process for producing diolefins
INVENTOR(S): Robinson, Paul R., Costa Mesa, CA, United States
Moorehead, Eric L., Diamond Bar, CA, United States
PATENT ASSIGNEE(S): Union Oil Company of California, Los Angeles, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4567314		19860128
APPLICATION INFO.:	US 1984-595333		19840330 (6)

RELATED APPLN. INFO.: Division of Ser. No. US 1981-335531, filed on 29 Dec 1981, now patented, Pat. No. US 4455388 which is a continuation-in-part of Ser. No. US 1981-328446, filed on 7 Dec 1981, now patented, Pat. No. US 4454245
DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Dixon, Jr., William R.
ASSISTANT EXAMINER: Prezlock, Cynthia A.
LEGAL REPRESENTATIVE: Sandford, Dean, Baran, Robert J., Williams, Cleveland R.
NUMBER OF CLAIMS: 29
EXEMPLARY CLAIM: 1
LINE COUNT: 640
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB High surface area **oxidative dehydrogenation** catalysts which are suitable for converting C.sub.4 to C.sub.8 mono-olefins to diolefins are disclosed, comprising the oxides of an alkali metal, vanadium, phosphorus, and preferably tin in combination with a crystalline silica having a surface area between 30 M.sup.2 /g to 450 M.sup.2 /g and wherein the vanadium has an average valence in the